Regional Supervisor, Branch of Wildlife Refuges

February 28, 1961

Regional Engineer

Lake Andes National Wildlife Refuge, South Dakota - Annual Water Program for 1961

We have reviewed the subject program. Our comments are as follows:

Water Rights

Our Bureau has water rights on file and recorded in the office of the South Dakota State Engineer as follows:

File No. U.S. 517-3 covers Dam No. 1 and Dam No. 2 and permits use of 13,721 acre-feet of storage annually plus 6,813 acre-feet for seasonal use.

Permit No. 220-3 covers the artesian well water supply in amount of 2.22 cfs for use in the 280 acre pond of Owens Bay.

Water Management

We concur in the proposed operation for 1961 which is largely dependent on the nature of the spring run-off. Normally the excess water can be spilled into the center unit from the north and south units.

We note the equation given - assumed data 100 equals 1437.25 feet above mean sea level. Field surveys to check all structural, water gauge, and bench mark elevations are scheduled in the fourth quarter of fiscal year 1961.

John D. Umberger

P.S. Attached is water management program. A copy was made for our file.

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Attachment

WATER MANAGEMENT PROGRAM

LAKE ANDES REFUGE

1961

A. Existing Water Supplies

Water Supply - January 1, 1961

Unit	Guage reading*	Management level*	Maximum level*	Inflow (approx.)	Outflow (approx.)
Owens Bay	4.50	4.50	6.50	780 gpm	500 gpm
North	97.15	99.10	100.00	none	none
Center	95.32	97.60	100.00	none	none
South	93.04	97.60	100.00	500 gpm	none

* Assumed 0.00 for Owens Bay equal to 1435.52 msl and assumed 100.00 for other Units equal to 1437.25 msl.

B. Summary, 1960 Conditions

1960 Guage Readings, Lake Andes Refuge

End of	Owens Bay Unit	North Unit	Center Unit	South Unit
January	4.00*	93.75*	dry	90.75*
February	4.00	93.75*	dry	90.75*
March	5.00	103.60	96.19	94.18
April	4.00	99.20	97.10	94.43
May	4.30	99.15	97.00	94.68
June	4.30	98.80	96.70	94.28
July	4.10	98.28	96.07	93.72
August	4.30	97.77	95.72	93.47
September	4.45	97.50	95.57	93.20
October	4.50	97.27	95.39	93.11
November	4.50	97.15	95.32	93.04
December	4.50	97.15	95.32	93.04

* Too low to guage, levels estimated from topographic survey data of December, 1959 courtesy of U. S. Bureau of Reclamation.

The increase in the levels of all Units that occurred in March resulted from the rapid thawing and subsequent run-off of an exceptionally heavy snow cover in the Lake Andes watershed. Most of this entered the North Unit and all surplus was spilled into the Center Unit where it was retained as authorized by the Regional Office.

Aquatic plants responded well on the newly-flooded Units. It was estimated that roughly one-third of the South Unit, one-half of the Center Unit and two-thirds of the North Unit were covered by beds of

sago pondweed (an aerial photography survey of the extent of these beds has not been analyzed at this date). Good stands of hardstem and river bulrush, sedges and smartweeds came into the bays and many of the shallow water areas.

Waterfowl food production was considered excellent on these Units. A breeding population estimated at 532 pairs of ducks used the Refuge and fall concentrations reached 27,050 coots and 141,000 ducks. Most of these birds obtained at least part of their food from the aquatics produced on these Units.

The planned increase in the Owens Bay water level was attempted during the first week of May. Evapo-transpiration losses were great enough be that time; however, that the artesian well (flow estimated at 780 gallons per minute) was never able to increase the level the desired one-half foot. As a result, there was no measureable change in the plant succession or food production on Owens Bay.

There were no problems of botulism or other unusual biological factors during the period.

6. 1961 Management Recommendations

There is considerable indication that the one-half foot increase planned annually for Owens Bay is not sufficient to provide the desired open shoreline. At present, dense stands of emergents (mostly river bulrush, cattails and phragmites) cover the entire shoreline from about one and one-half feet of water depth to at least one-half foot above the water surface. This growth of emergents extends throughout the shallow water areas also.

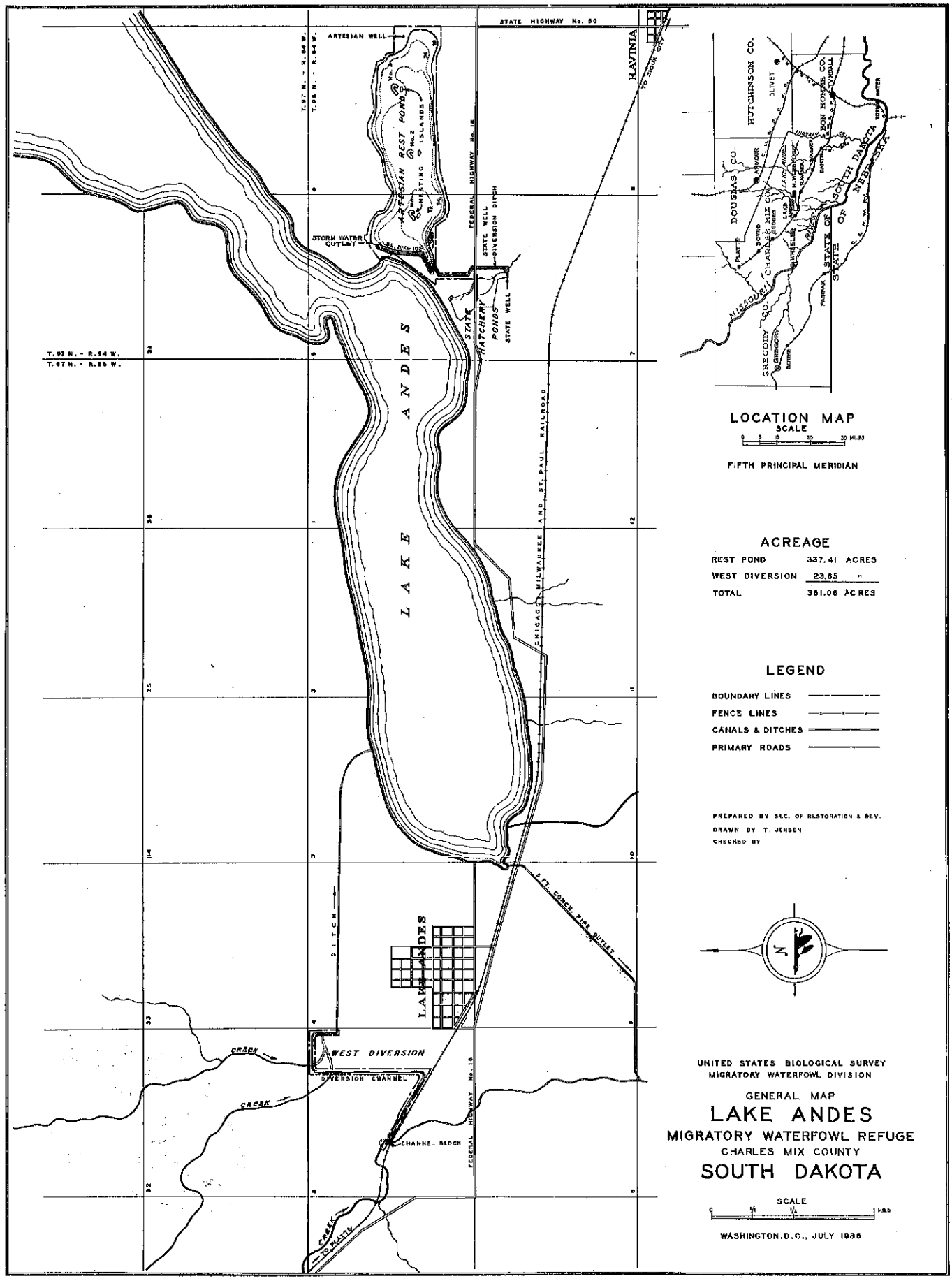
It is recommended that in order to provide some open shoreline and to reduce the areas over-grown to low-quality emergents, the level of Owens Bay be increased one-foot to the 5.50 level on March 15 or as soon thereafter as any danger of excessive run-off has passed. This increase is in line with the Water Management Plan which provides that the levels may be increased more than one-half foot if necessary to provide exposed shoreline. Vegetative transects, breeding pair counts and photographic records will be made in an effort to determine the effects of this practice.

Little control can be affected on the levels of the other Units. In the event sufficient run-off in received during the spring, each of the North and South Units will be raised to management levels and the excess allowed to spill into the Center Unit.

Respectfully submitted:

Harvey W. Miller

Harvey W. Miller, Wildlife Biologist



LOCATION MAP

SCALE

0 5 10 20 30 MILES

FIFTH PRINCIPAL MERIDIAN

ACREAGE

REST POND	337.41 ACRES
WEST DIVERSION	23.65 "
TOTAL	361.06 ACRES

LEGEND

BOUNDARY LINES

FENCE LINES

CANALS & DITCHES

PRIMARY ROADS

PREPARED BY SEC. OF RESTORATION & DEV.
DRAWN BY Y. JENSEN
CHECKED BY

N.

UNITED STATES BIOLOGICAL SURVEY
MIGRATORY WATERFOWL DIVISION

GENERAL MAP

LAKE ANDES

MIGRATORY WATERFOWL REFUGE

CHARLES MIX COUNTY

SOUTH DAKOTA

SCALE

0 ½ 1 MILE

WASHINGTON, D.C., JULY 1936